

Do's and Don'ts of Installing a RIS

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This report reviews several important issues relating to the acquisition of a radiology information system (RIS). It emphasizes the importance of defining specific goals for computerizing a department and for understanding that department's manual operations. It then outlines methods to request proposals from prospective vendors and to evaluate their responses. Suggestions for negotiating a favorable arrangement with a vendor follow. Finally, the summary lists five do's and three don'ts for selecting and installing a RIS.

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CURRENT RADIOLOGY information systems (RIS) apply computer assistance to patient registration, scheduling, and examinations as well as to tracking/process control, film library, reporting, management, and billing activities.^{1,2} Installing a radiology information system (RIS) can be a most rewarding as well as one of the most frustrating activities in a radiology department.^{3,4} Although considerable experience has been gained over the last twenty years with the frustrations of computerization, overall the rewards have become increasingly apparent, and the number of RIS installations has steadily increased. This paper summarizes some techniques to avoid frustrations while maximizing the rewards of installing a RIS.

The most important key to success is selecting the best RIS for a department. Formal methodologies⁵ to select a system have been described. Reviewing these methods can help avoid blunders in the selection. However, they all require hard work and a detailed knowledge of radiology operations tempered by abundant common sense.

GOALS AND OBJECTIVES

The initial and perhaps the most important step in the selection process is to define an explicit list of objectives that are to be achieved by installing a RIS.⁶ Such objectives might include reducing delays in obtaining exams, reducing patient time in the department, increasing efficiency of personnel and equipment, reducing turnaround time for reports, improving

the speed and accuracy of billing, or providing better management statistics. An objective that may assume overwhelming importance in these days of cost containment for medical care is the reduction of overall expenses in radiology. To the extent possible, these objectives should be stated quantitatively. For example, an objective might be to reduce average report turnaround to four hours and maximum report turnaround to 24 hours. Similarly, an objective might be to pay for the entire cost of a RIS by real reductions in radiology's budget over a three year period. The objectives should be written out and agreed to by key individuals both in the department and in the hospital before any prospective vendor is consulted. Vendors tend to state objectives according to the capabilities of their own systems. Unless the department has a clear understanding of its goals in computerization, installing a RIS can be delayed for months or years because there are no explicit agreed-upon criteria to decide which system is best.

OPERATIONS ANALYSIS

In addition to defining the objectives of computerization, it is also important to be certain the current operation of the department is well understood and documented. This may simply require collecting the written policies and procedures used in the department. Sometimes however, it may be necessary to write down such policies and procedures. In either event, it is desirable to have these documents reviewed by the supervisors and employees who actually perform the work done in the department. In doing this it is helpful to direct their attention to special activities which may be performed only at infrequent intervals. It is also important to elicit information regarding any undocumented procedures used in exceptional circumstances or by

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only special individuals or only for special physicians or clinics. Over the years, most departments have evolved special or even idiosyncratic procedures that are used to provide the wide variety of services required of radiology. On examination, some of these procedures may be essential and must be supported by the RIS. Other procedures may simply be wasteful and should be abandoned. Careful documentation of operating policies and procedures in preparing for computerization may in itself suggest efficiencies that could be achieved with the manual system.

REQUEST FOR PROPOSALS

Once the objectives of computerization and the current operating procedures are well understood and explicitly defined, it is possible to list RIS features that might help achieve these desires. A list of such features is frequently included in a request for proposals (RFP) that can be submitted to multiple prospective vendors. The RFP should contain a relatively complete list of features—including some that may not be absolutely essential to achieve the major objectives of installing the RIS. The importance of each feature in achieving departmental goals should be weighed carefully when the vendors responses are analyzed. Withholding these priorities from vendors can result in more accurate responses.

In addition to listing specific features desired, the RFP should contain a description of the department and it should request information regarding the price of the system, proposed payment schedules, delivery and installation schedules, training of departmental employees, system documentation, and maintenance or service arrangements and cost. Copies of the RFP should be sent to all prospective vendors along with instructions requesting that written responses be submitted within a specified time. The instructions should make it clear that no additional information, such as the identity of members of the selection committee, price the department is willing to pay, or priority of departmental objectives for the RIS will be provided. Adhering to these policies not only assures fairness to all vendors, but it also eliminates unwanted solicitations from sales people. If one or more of the vendors points out that a critical piece of infor-

mation has been omitted from the RFP, the data should be provided in writing to all vendors, and the deadline may be extended appropriately.

The first step in evaluating the vendor's proposals is to review the written documents submitted. This is best done by a committee composed of individuals with responsibility for selecting the system and who are familiar with the goals to be achieved by computerization. Vendors will sometimes state that a given feature is "under development," and may even provide a specific date on which the feature is expected to be in clinical operation. Those familiar with software development know how little reliance can be placed on such promises. Although the vendor is probably not being dishonest, his priorities for software development may change after the sale is made, or his programming staff may be reduced sharply before the new development has been completed. This experience has been widely shared by many departments acquiring systems from many vendors and the only prudent attitude is to regard the feature as being unavailable in the system. The committee should be more skeptical if the vendor admits a feature is not available but offers to develop it as a customized programming job in the future.

Evaluating the features described in responses to an RFP should be an active rather than a passive process. Written materials describing the desired features of an RIS are rarely clear and complete enough to evaluate the features of a system adequately. A better evaluation is obtained by demonstrations. A demonstration of the system either at the vendor's office or by means of a telephone link should be arranged for systems that have a reasonable possibility of meeting the department's goals.

Although the vendor will usually be happy to have its employees operate the system while the prospective buyer looks on, it is much better to have departmental personnel also use the system to carry out functions of interest. Such use not only tends to uncover any weaknesses in the system, but it also gives some indication of how easy it will be to train departmental personnel to use the system. At the same time, it should be borne in mind that a system which is easy for a novice to use may also be inefficient for a well-trained individual who is experienced in using the system. Another excellent way to evaluate a RIS

is to visit a department—preferably one very similar to the prospective buyer's department—that uses the system routinely. Observing a system in actual clinical use can provide a much better idea about how “user-friendly” and efficient it actually is. In addition, personnel operating or managing a RIS will be well aware of any problems with the system or the vendor's support of it. These “hands on” evaluations of a RIS through demonstrations and site visits to other departments are quite time consuming, but they are virtually essential to avoid the frustration of installing a system that fails to achieve its goals.

NEGOTIATION

Because of the large number of systems available commercially, most departments can find at least two systems that meet their stated goals. This makes it possible to negotiate favorable terms for acquiring the RIS. Although getting the lowest price is obviously important, other factors should also be considered. It is desirable to require the vendor to specify and take responsibility for equipment installation at the site. This should help assure that the electrical power and physical environment of the system's hardware is adequate.

Installing the RIS software often requires entering a large amount of data such as names and authorization codes for departmental personnel, examination descriptions, codes and prices, as well as hospital locations, clinic names, referring physician names, radiology examination rooms, and many other items. Defining this information, typing it into the computer, and checking it for accuracy can require many hours of effort that cannot be supplied easily by departmental personnel. It may be necessary to have the vendor assume this responsibility.

It is also important to evaluate the types and amount of training the vendor can provide. Training may need to include writing and distributing new operational procedures for the department and preparing new job descriptions for employees, as well as providing instructions to accomplish specific tasks on the computer. Training may also include slide presentations that emphasize to employees the improvements expected from installing a RIS. It is important in these presentations to emphasize that ample training will be provided to help each employee

master the operation of the computer. It is even more important to emphasize that no lay-offs will be expected as a result of the new system. Although considerable cost savings in personnel can be achieved by installing a RIS, the author is unaware of any installation in which these reductions were not accomplished through attrition associated with normal turnover. In addition, training should include terminal sessions during which each employee can actually operate the system (under expert supervision) using test data. Finally, help must be immediately available to resolve operational problems without compromising patient flow during the first one to two weeks of using the RIS clinically.

The proposed schedule of payments for the RIS should be evaluated with considerable care. Vendors will often propose that a small payment be made when the contract is agreed to. The remainder of the purchase price may be due when the system hardware is delivered, although sometimes the vendor will agree to delaying a small portion of the final payment until the system has been successfully installed. The vendor will frequently point out that these are their “standard” arrangements, and that they cannot be altered. It is not unreasonable for the vendor to require a small down payment as evidence of the department's commitment to purchase the system when the contract is signed. However, if the vendor has represented his system accurately, and if he has assured himself that your department will be able to use the system to good advantage, he should have little difficulty in delaying full payment until the system has been successfully used for patient care. Sometimes, a vendor will agree to provide the system and maintenance over a period of time such as three years in return for monthly payments. This allows the department to pay for the system with operational savings and it provides an important incentive for the vendor to help assure a smooth installation and operation. Negotiating a reasonable payment schedule can often be difficult, and it may be valuable to involve a lawyer to represent hospital and department interests.

SUMMARY

The discussion above can be summarized in the following list of five do's and three don'ts. If these rules are adhered to by a department, it is

quite likely that the department can install a RIS and realize its considerable benefits with a minimal amount of frustration. A continually growing number of departments have done so. Yours might be next.

Do list goals of computerization. These should be written out, as quantitative as possible, and agreed to by all individuals with responsibility for selecting the system and living with its performance.

Do know your current system. Make sure you understand all the policies and procedures under which the department currently operates. Remember that the 10% of unusual, occasional, or idiosyncratic operations can account for 90% of your frustrations when a RIS is installed.

Do select the best system for your department. This is obvious, but not easy. Give the selection a lot of thoughtful consideration using demonstrations and site visits.

Do change departmental operations to fit the system. Although it is frequently tempting to use a RIS to perform functions (often idiosyncratic

ones) for which it was not originally designed, this usually causes problems. It is preferable to change departmental operation to utilize those procedures the RIS is designed to support.

Do expect the unexpected. No matter how carefully the installation of a RIS has been planned, something entirely unexpected will go wrong. Knowing that this will happen can help you get the problem fixed instead of wasting time trying to assign the blame.

Don't rely on future development of the RIS. If achieving the fundamental goals of computerization hinges upon new developments to the RIS, you are likely to be disappointed.

Don't pay until the system works. This can require tough negotiation, but it should be acceptable to a vendor that has accurately represented his capabilities.

Don't lay off employees abruptly. Although major personnel savings can often be realized by installing a RIS, it is almost always possible to achieve these reductions through a process of attrition.

REFERENCES

1. Lehr JL, Steinberg FL: The radiology information system, its evolution and current status. *CRC Crit Rev Med Informatics* 1:259-299, 1987
2. Arenson RL (ed): Computers in radiology. *Radiol Clin North Am* 24:1-129, 1986
3. Arenson RL: How to install, manage and evaluate a computer information system, in *Planning Guide for Radiologic Installations. Fascicle 9: Computer Information Systems*. Reston, VA, American College of Radiology, 1981, p 131
4. Williams RC, Boehme JM, Choplin RH, et al: Often overlooked considerations in implementing computer systems, in *Proceedings 8th Conference Computer Application in Radiology*, Reston, VA, American College of Radiology, 1984, p 601
5. Shannon RH: How to choose a radiology information system, in *Planning Guide for Radiologic Installations. Fascicle 9: Computer Information Systems*, Reston, VA, American College of Radiology, 1981, p 111
6. Burnett LL: Overview—goals and priorities, in *Planning Guide for Radiologic Installations. Fascicle 9: Computer Information Systems*, Reston, VA, American College of Radiology, 1981, p 9